WARM SEASON GRASSES FOR SUMMER FORAGE

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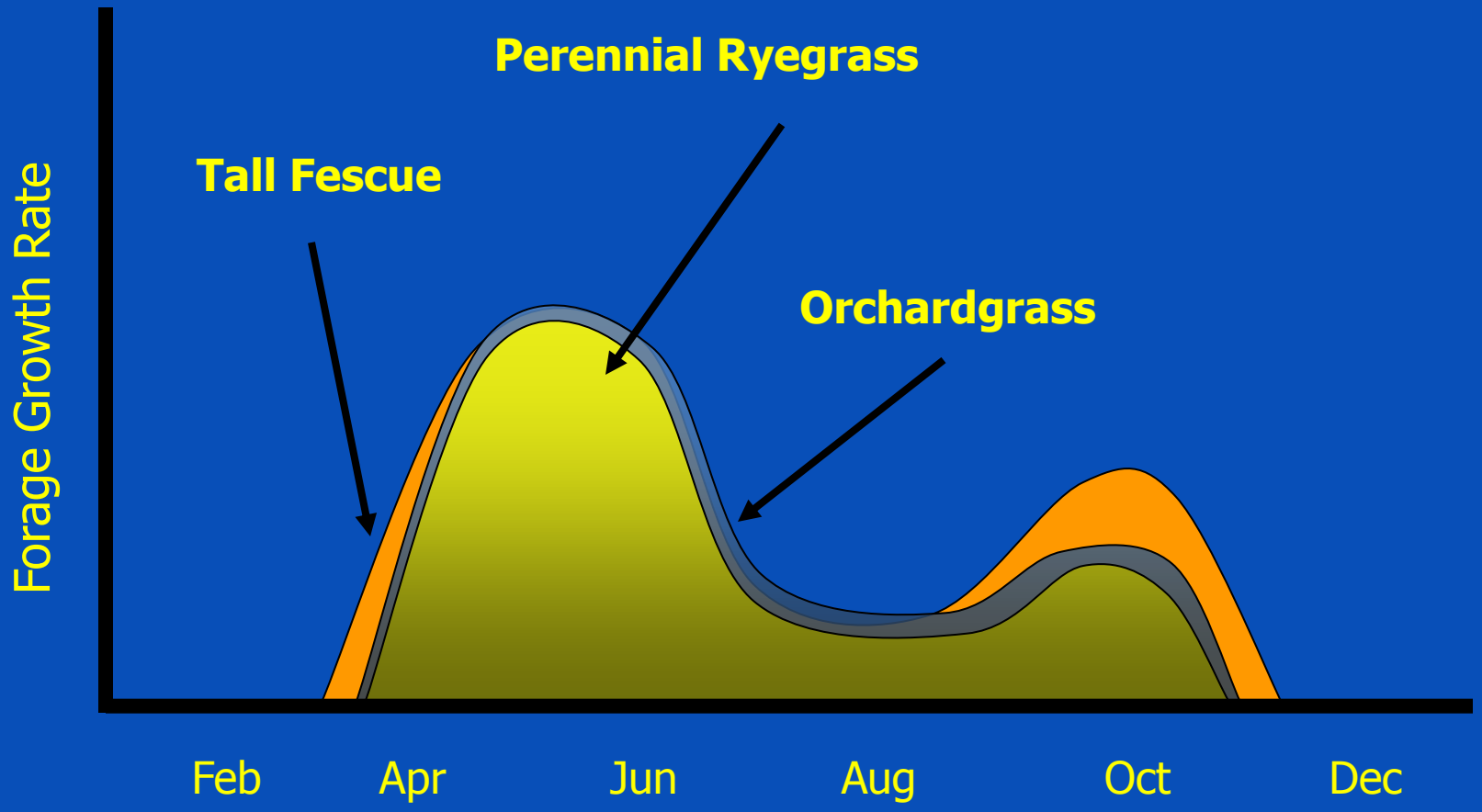
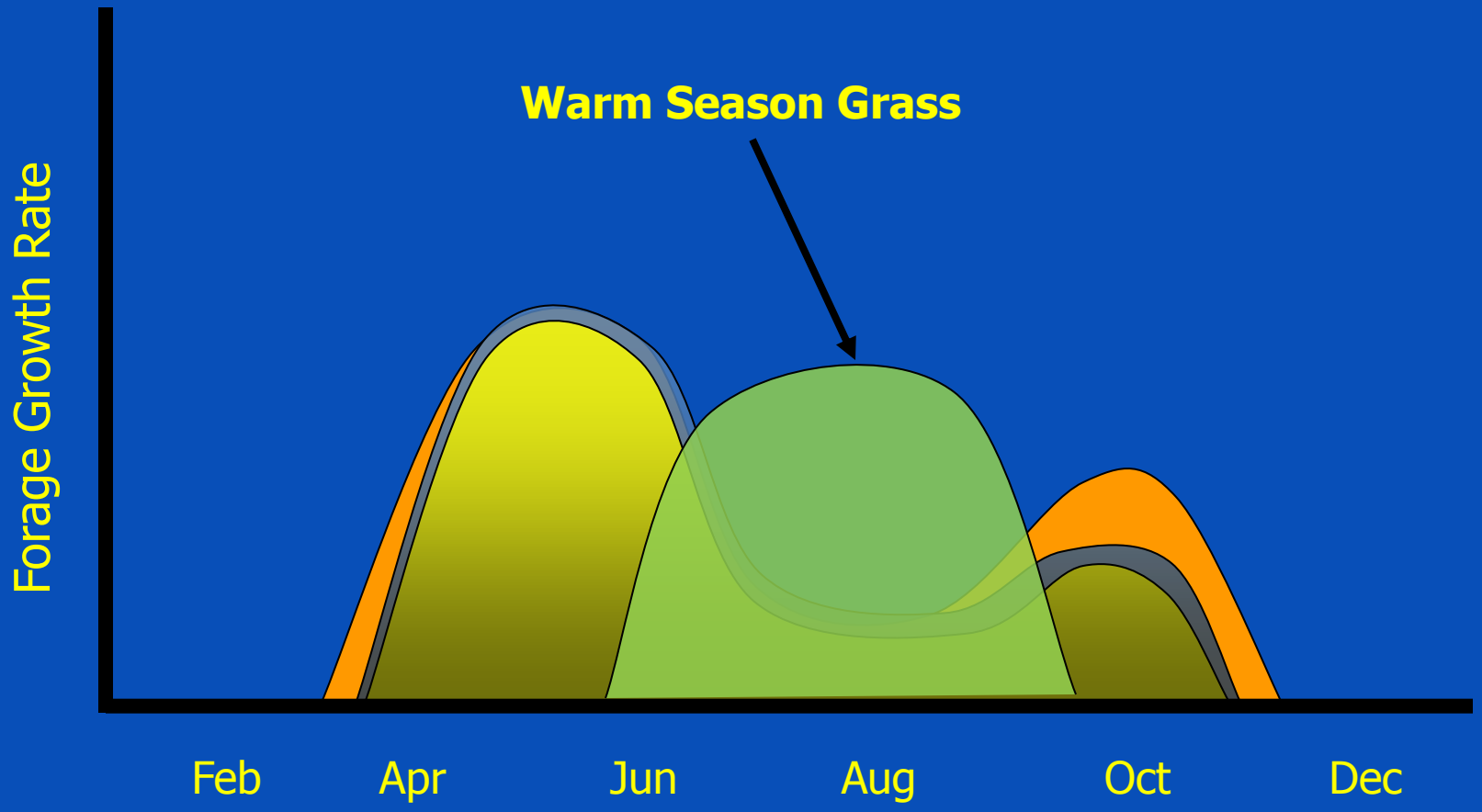
Natural Resources Conservation Service

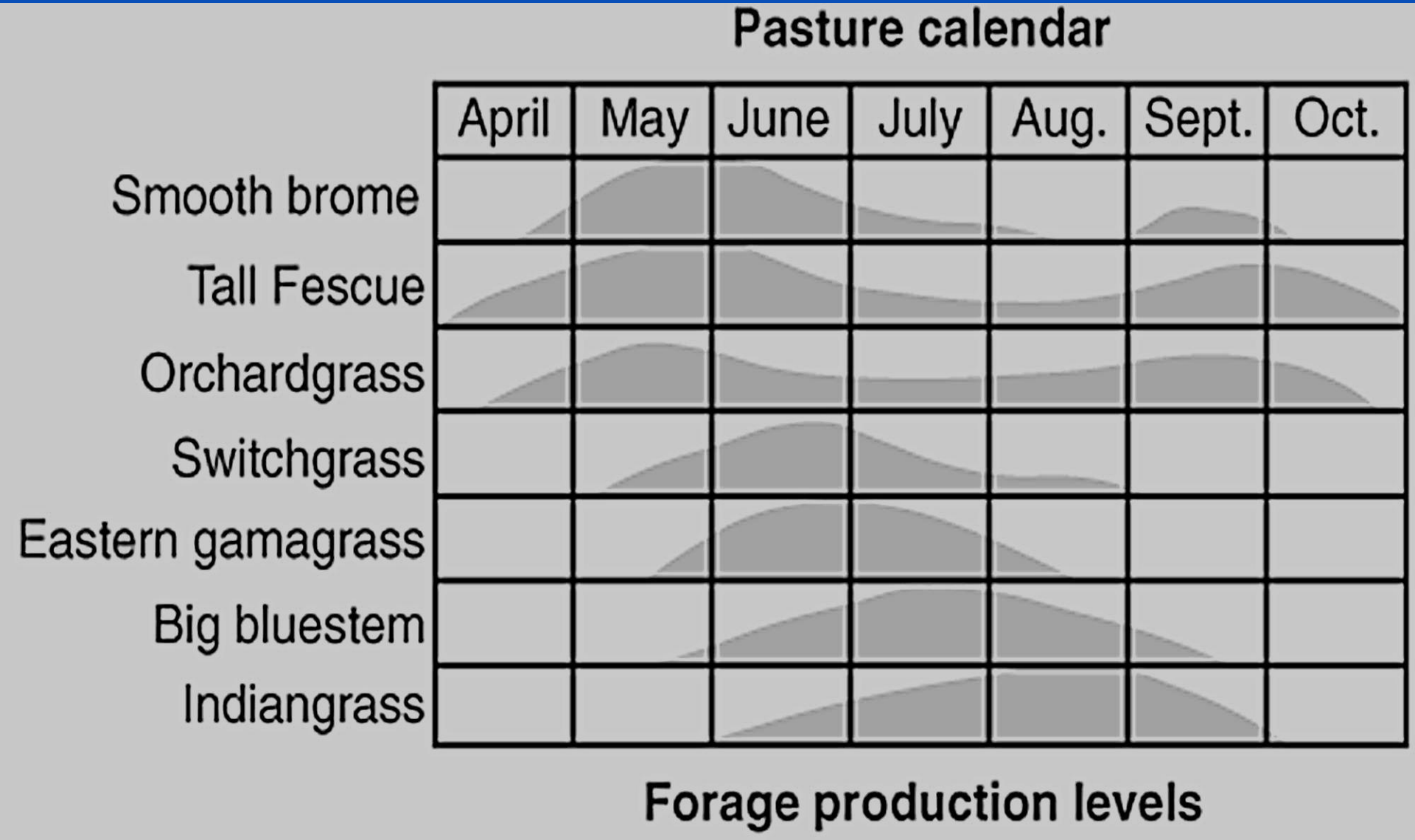
Cool Season Grasses



Adding Warm Season Grasses



Growth Curves of Various Grasses



Optimum Growth - Temperature

Forage Type	Optimum Growing Temperature (F)
Cool Season Grasses	60 – 80
Legumes	70 – 90
Warm Season Grasses	80 – 95

Benefits of Warm Season Grasses?

- Good summer production
- Helps manage fescue endophyte problem
- Helps manage spring growth of cool seasons
- Favorable haying weather
- Adapted/persistent
- More efficient users of H2O & Nitrogen than cool season grasses
- Wildlife benefits (NWSG)
- Good quality and animal performance
- 38 % higher season long ADG when WSG included in summer grazing as compared to tall fescue full season

Predominant Warm Season Grasses in Missouri

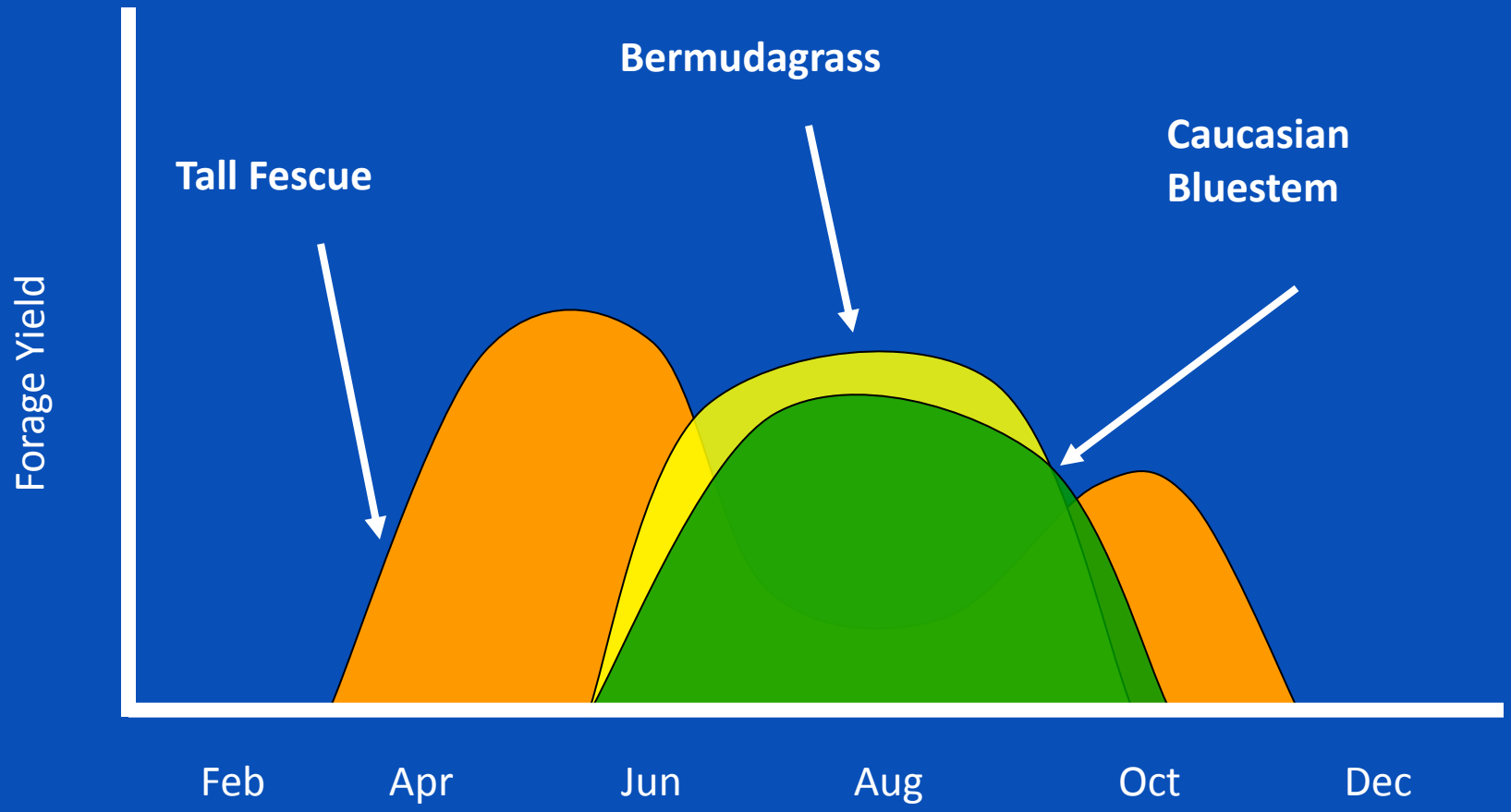
- Native WSG
  - Big Bluestem
  - Indiangrass
  - Switchgrass
  - Eastern Gamagrass
  - Others
    - Little Bluestem
    - Sideoats Grama

- Introduced WSG
  - Bermudagrass
    - common types
    - hybrids
  - Old World Bluestems
    - Caucasian
    - Plains
    - WW Spar

Warm Season Grasses in Missouri

- **Native WSG**
  - Provide wildlife habitat
  - Well adapted
  - Require longer rest periods
  - Taller heights
  - Require moderate levels of N
  - Less sensitive to climate
  - Deep rooted
- **Introduced WSG**
  - Provide good late summer forage
  - Need shorter rest periods
  - Shorter heights
  - Require high levels of N to meet yield goals (bermuda)
  - More sensitive to climate (bermuda)
  - May invade native grasslands?

Introduced Warm Season Grasses



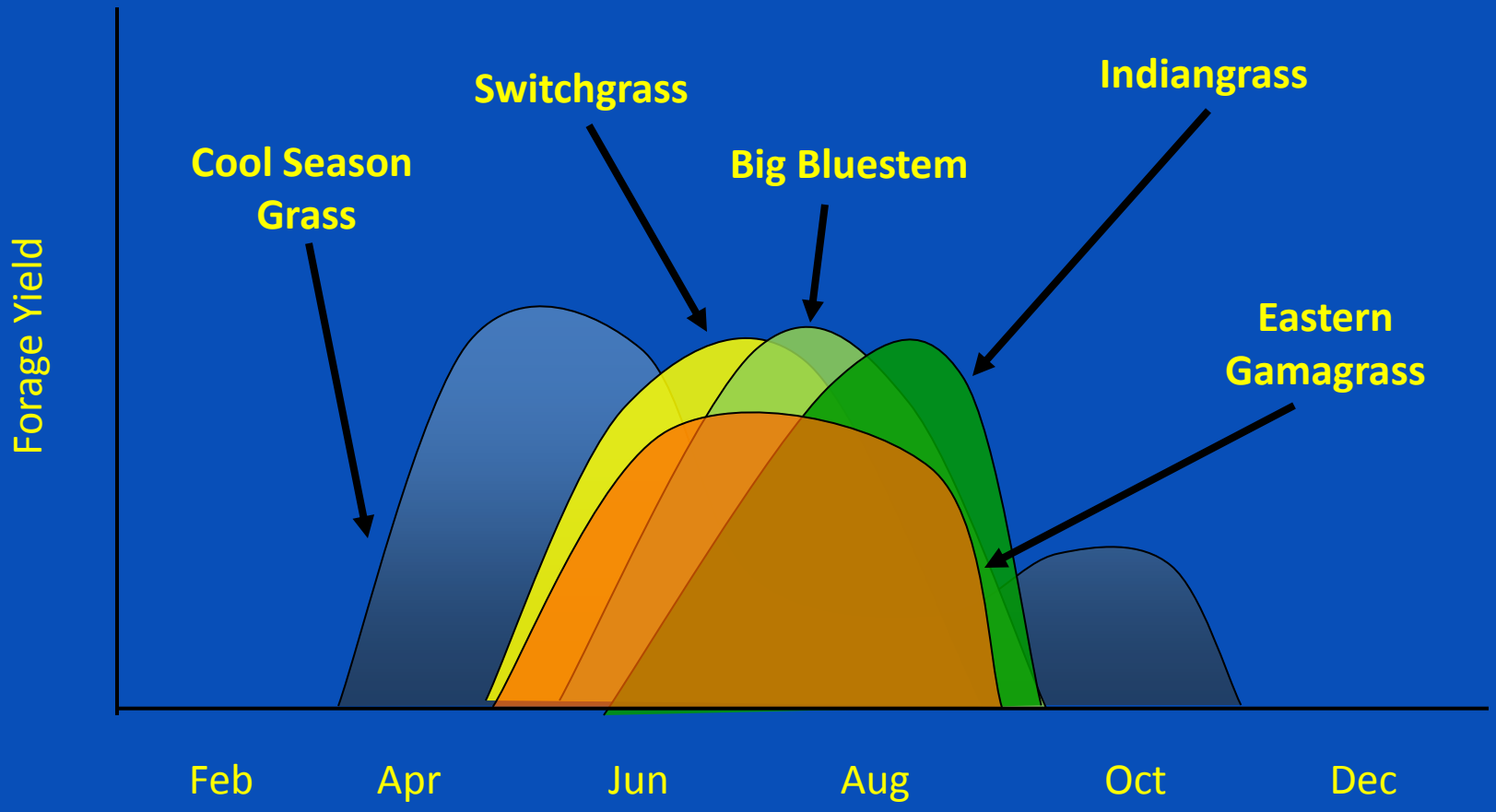
Bermudagrass

- Warm-season grass
- Rhizomes & stolons
- Challenge to establish
- Winter hardiness issue
- Requires high fertility

Caucasian Bluestem

- Quick establishment
- Grows on poor soils but responds well to fertility
- Able to withstand close and frequent grazing

Native Warm-Season Grasses



Switchgrass

- Earliest of the Native Warm Season Grass (too early?)
  - May 15 – Aug 1
- Often ready for grazing before the cool season grasses have stopped producing.
- Well adapted to wetter sites
- Aggressive - Competitive

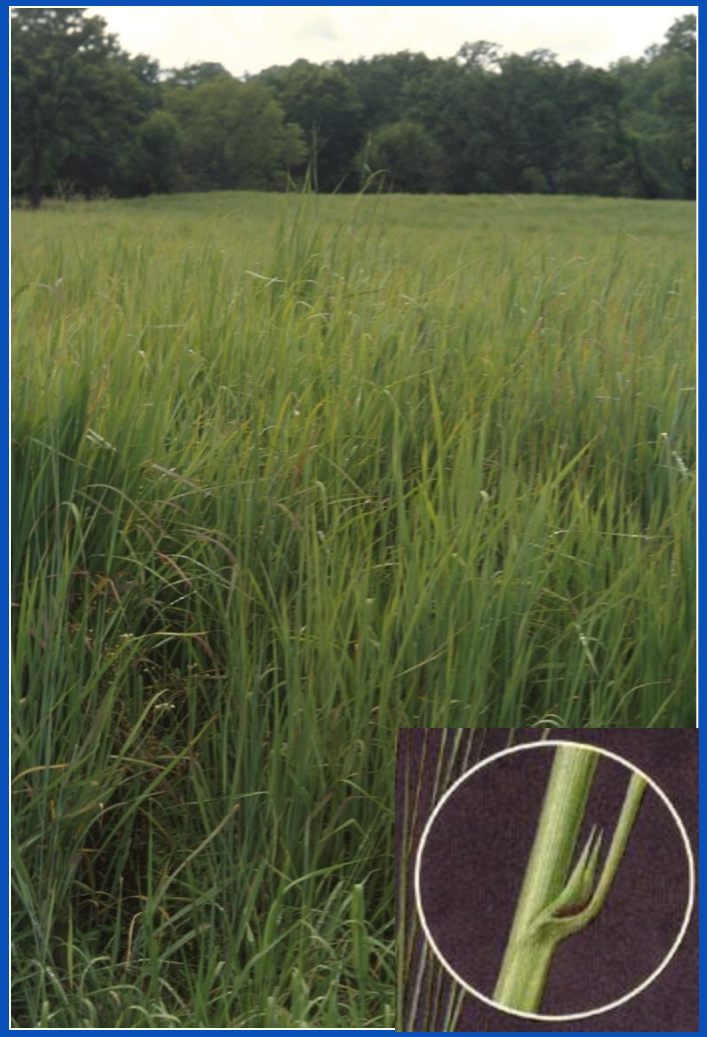
Eastern Gamagrass

- 85% of growth between May 15 & August 31
- Tolerates wet soils
- Highly palatable
  - "ice cream grass"
- Easily overgrazed
- Yields 5 to 10 tons reported
- Poor seed production & germination
- Establishment difficult

Big Bluestem

- Main growth
  - Late June – Early Sept
- Drought tolerant
- High quality
- High palatability
- Good production timing for our area

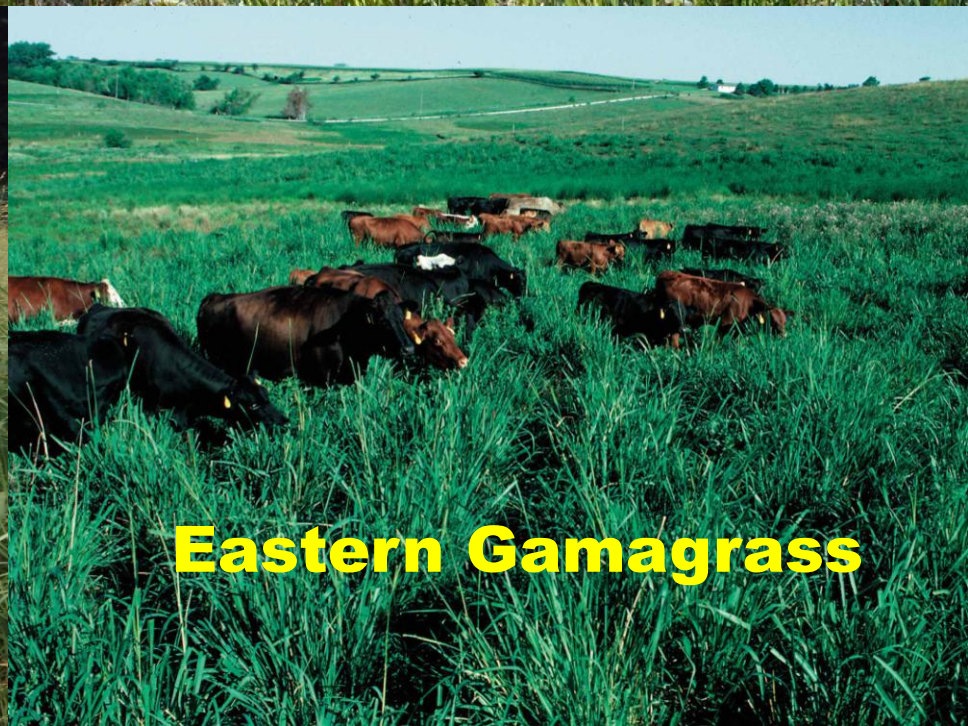
Indiangrass



- A late producer - 1-2 weeks later than Big Bluestem
- Lower yielding
- Good mix with Big Bluestem
- High palatability
- Not good on wet sites
- Good winter hardiness and drought tolerance

A mixed stand of Indiangrass and Big Bluestem during July in Kentucky

Native Warm Season Grasses



Caucasian Bluestem

Bermudagrass

Warm Season Grass Adaptability

Species	Yield	Tolerance to poor drainage	Tolerance to low fertility	Drought tolerance	Heat tolerance	Cold hardiness
Bermuda Grass	M-H	Fair	Fair	Fair	Good	Fair
Old World Bluestem	M-H	Poor	Good	Good	Good	Good
Big Bluestem	M-H	Fair	Good	Good	Good	Good
Indian Grass	M-H	Fair	Good	Good	Good	Good
Eastern Gama Grass	H	Good	Fair	Good	Good	Good
Switch Grass	M-H	V. Good	Good	Good	Good	Good

Warm Season Grass Quality
Southern MO Data (1994-2000)

Species	Crude Protein	DOM
Big Bluestem	6.35 – 15.28	60.20 – 69.32
Indiangrass	6.83 – 14.61	56.24 – 67.70
Switchgrass	6.43 – 15.78	58.70 – 67.20
Eastern Gamagrass	5.73 – 16.31	58.87 – 68.74
Bermudagrass	9.25 – 15.28	62.44 – 75.29
Caucasian Bluestem	8.93 – 21.53	61.56 – 73.31

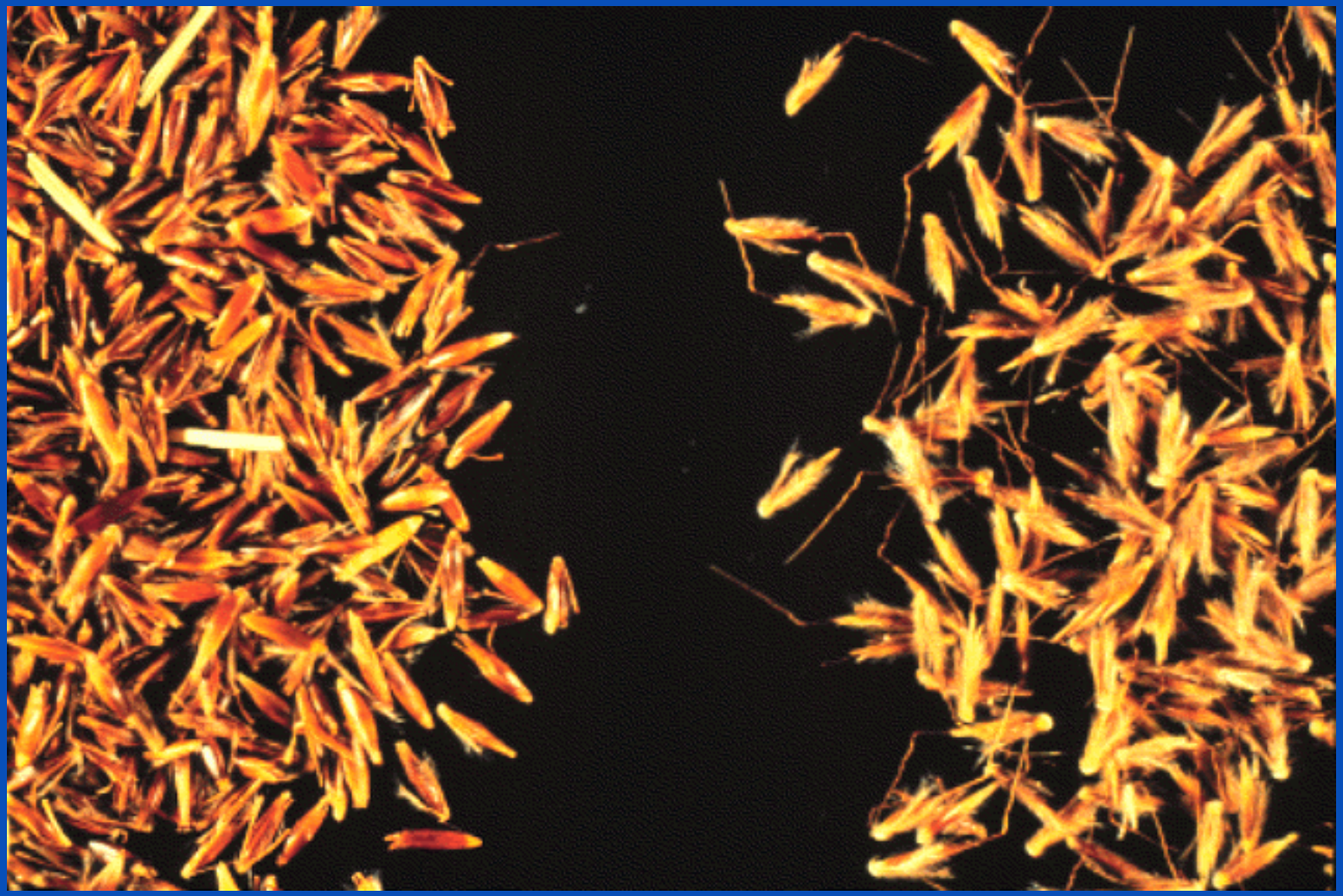
2004 WSG Forage Quality – *Ian Kurtz*

Species	Date	CP%	DOM%
Big Bluestem	5/26	16.54	70.1
	7/03	16.34	71.89
	7/11	16.71	71.19
Indiangrass	6/16	11.58	65.35
Switchgrass	5/26	16.69	67.56
	6/02	14.66	66.16
	6/11	16.79	66.74
Caucasian	6/2	12.24	70.98
	6/11	17.79	66.74

Establishment

- Interim Crops
  - "Spray-Smother-Spray"
    - Minimum 1 year. 2 years are better.
    - Fall wheat or cereal rye/Spring Pearl Millet/Fall wheat or rye/Spring plant WSG
- Cultivation
  - VERY **FIRM**, CLEAN SEEDBED
  - Roll – Broadcast Seed – Roll
  - "If half the seed is showing on top of ground when done, about right"
- No Till
  - Drill that will handle seed
  - Seed depth = ¼"
- Seeding
  - Dormant (Dec 15 – Feb 15)
  - Spring (April 15 – June 1)


Great Plains



Establishment

- Fertility
  - No Nitrogen at establishment
    - (just feeds weeds)
  - Phosphorus/Potash/Lime
    - according to soil test
- Weed Control
  - Control crabgrass/foxtail and broadleaves
  - Some herbicides for crabgrass at establishment
- Harvesting
  - Plan for no production the year of establishment

First Year After Seeding

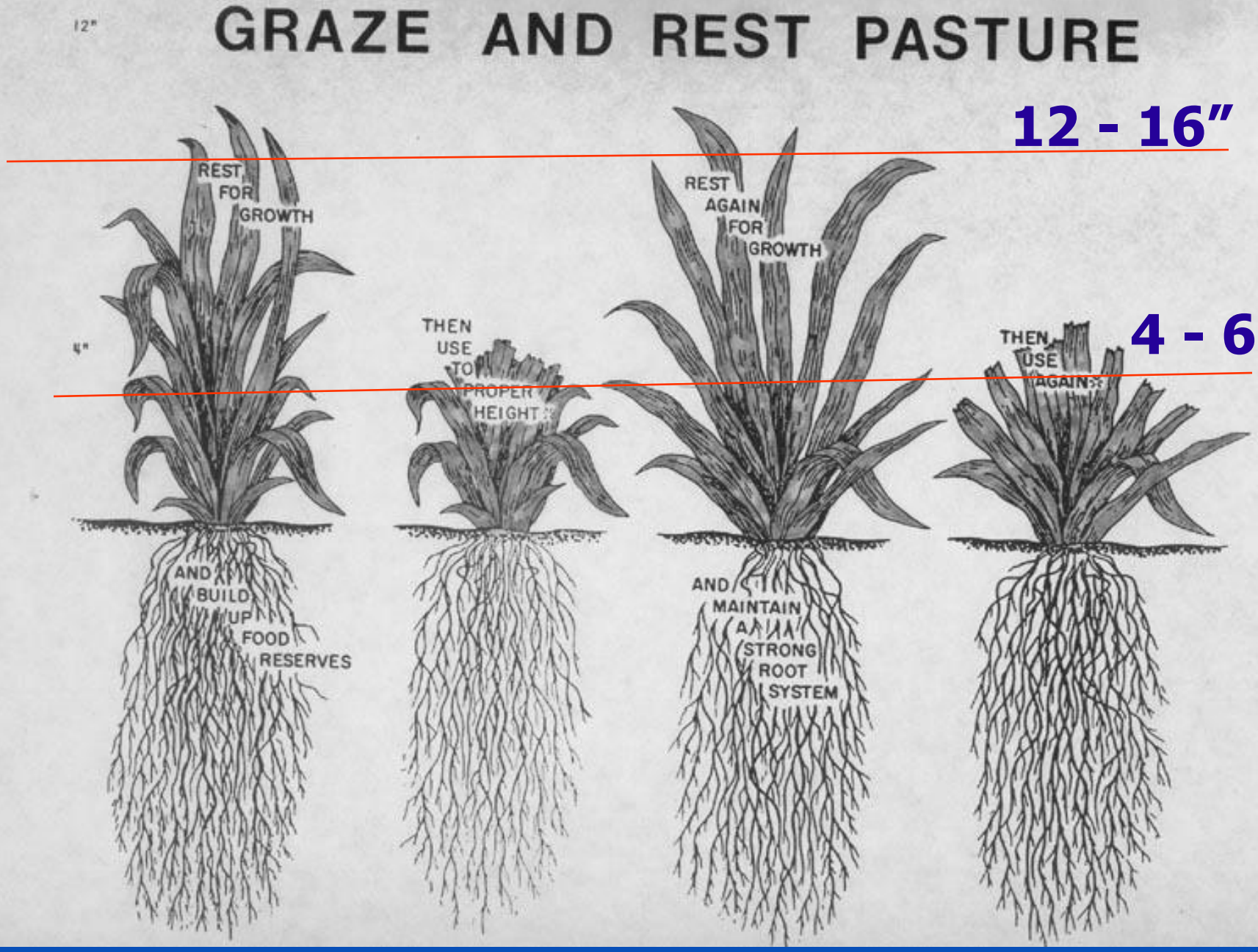
- 2375 pounds of hay per acre was cut
- 2298 pounds of forage was grazed per acre
- 4635 total pounds of production

Grazing Management

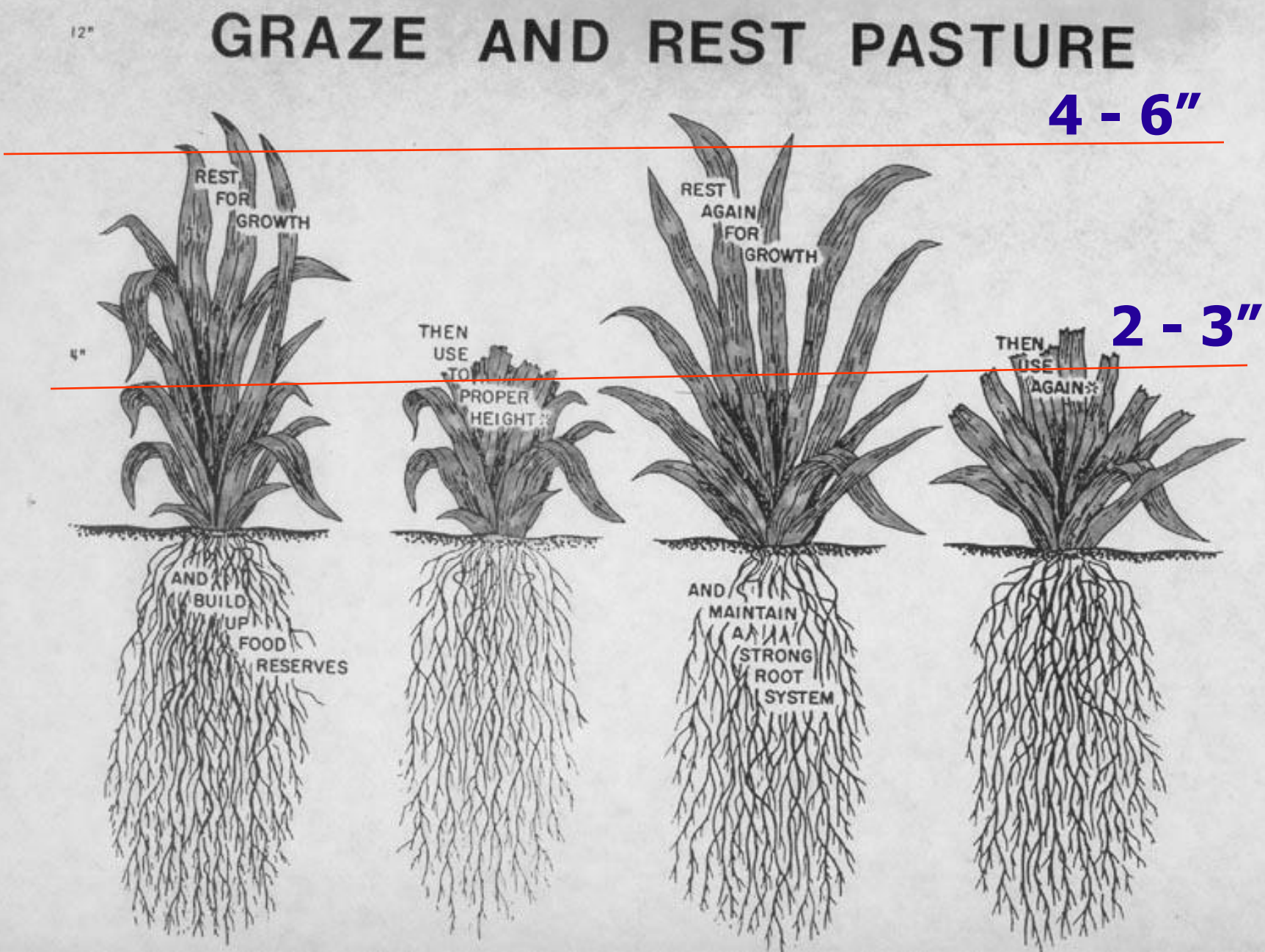
Grazing Management

- As a rule of thumb:
  - **Take Half and Leave Half**
- Turn-in Grazing Height:
  - Native warm season grasses = 12-16”
  - Introduce warm season grasses = 5-6”
- Minimum Grazing Height:
  - Native warm season grasses = 6-8”
  - Introduce warm season grasses = 2-3”

Native WSG Species



Introduced WSG Species



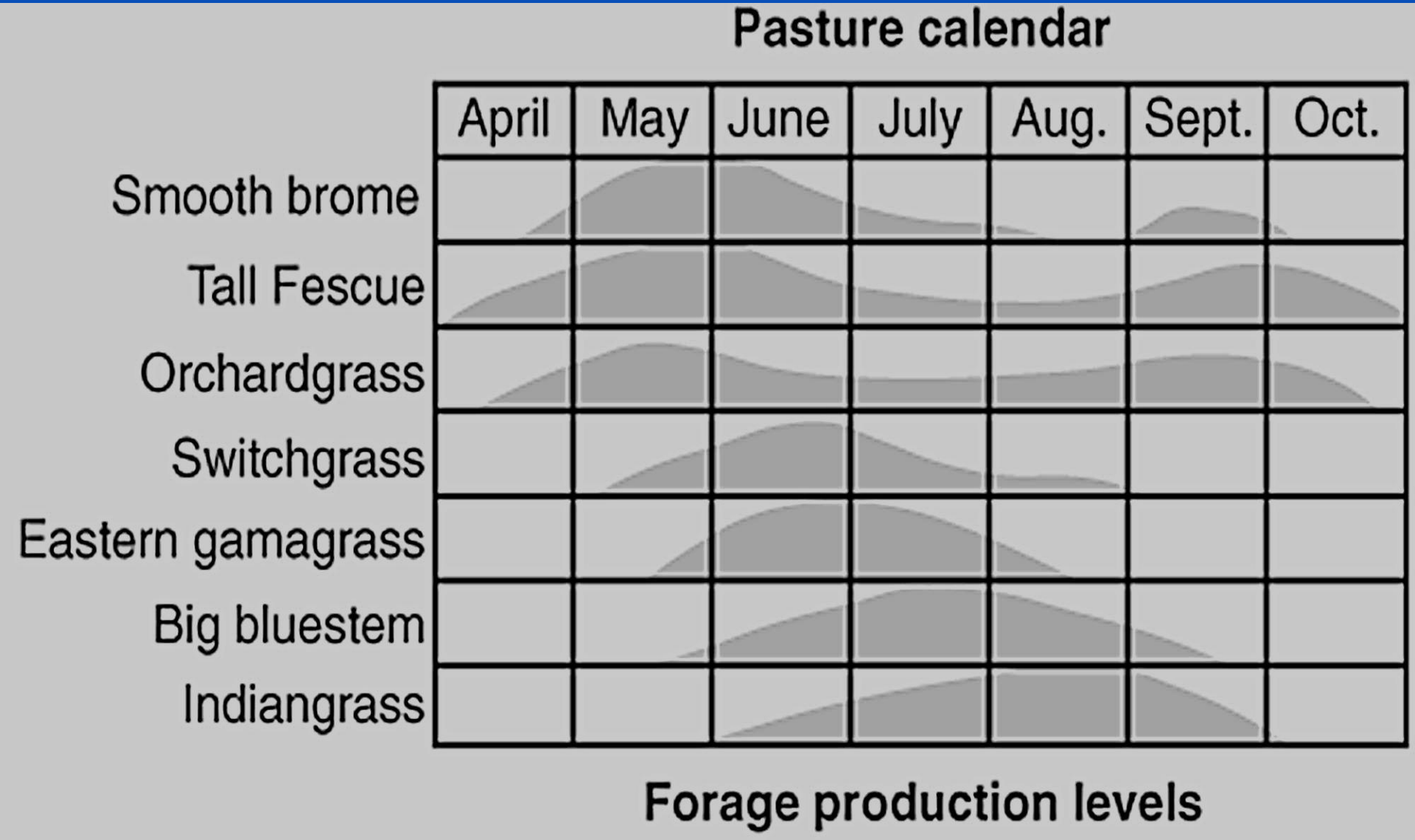
How Grasses Grow

- 95% of plant nutrients come from the atmosphere
  - (C, H, O)
- 5% of plant nutrients come from the soil
  - (N, K, Ca, P, Mg, S, Cl, Fe, Mo, Zn, B, Cu)

The Root System is Almost a Mirror Image of the Top Growth

Short, weak plants = short, weak roots

Growth Curves of Various Grasses



Fertility on Established Fields

- Soil test regularly to monitor needed fertility
- Apply what soil tests call for on P and K
- Nitrogen = 40 to 60 lbs
- Timing:

May 1 – May 15

Prescribed Burning

Every 3 to 5 years

Fescue Infestation

Tools:

- Prescribed Burning – Early April
- Early Heavy Grazing – Early April
- Spray pasture with glyphosate herbicide when WSG is dormant
  - Spring – March
  - Fall – November (best)

Switchgrass

Date	CP	DOM	Animal Perf.
5/26	16.69	67.56	2.412
6/2	14.66	66.16	1.924

Indiangrass

Date	CP	DOM	Animal Perf.
6/16	11.58	65.35	1.942

Big Bluestem

Date	CP	DOM	Animal Perf.
7/7	12.79	70.17	4.162
7/11	16.71	71.19	5.234

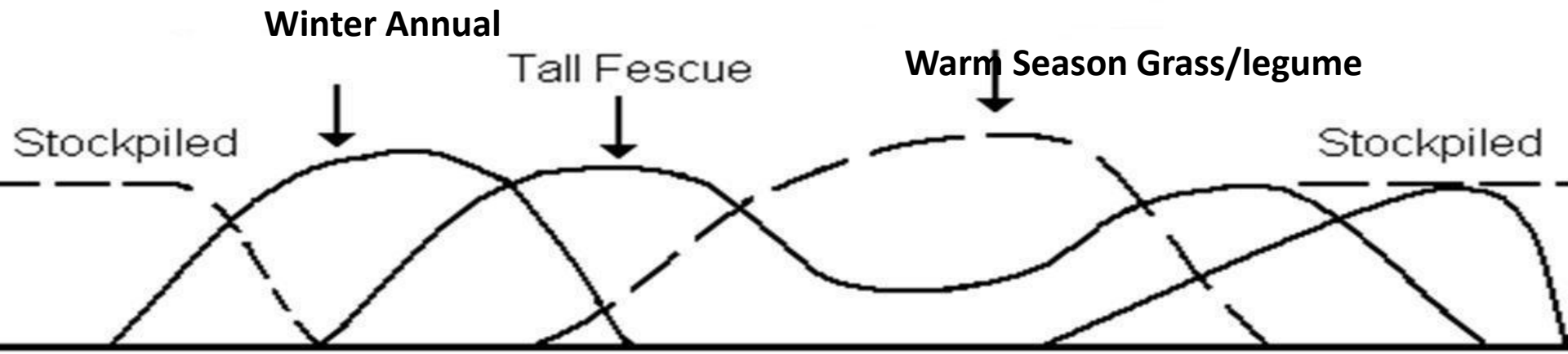
Considerations for Natives

- Animal performance has been averaging between 2.00 to 2.30 pounds of gain per day with no outside supplement.
- All animals are off natives by mid to late August:
  - Accumulates fuel for fire
  - Animal performance drops below 2.00 pounds of gain per day

Caucasian Bluestem

Date	CP	DOM	Animal Perf.
6/2	12.24	70.98	4.546
6/11	17.79	70.82	4.986

Possible Forage System for a 365 Day Grazing Season



So…Is 365 Days of Grazing Possible?

- It Depends – possible with good planning, intensive management and favorable weather
- Variations in weather make it more difficult some years

The End